

Chapter 9

Rotary-Wing Aircraft

This chapter provides the basic characteristics of selected rotary-wing aircraft readily available to the OPFOR. Both FM 100-60, *Ambush- and Mechanized-Based Opposing Force: Organization Guide*, and FM 100-63, *Infantry-Based Opposing Force: Organization Guide*, use descriptors to indicate aircraft capabilities. In each manual, a substitution matrix enables the trainer to structure OPFOR air support requirements as required by capability rather than specific type.

Rotary-Wing Aircraft, covers systems classified as light, attack, utility, multi-role, and transport aircraft. Multi-role aircraft are able to support missions across each of the categories. This chapter encompasses many aircraft which may have a dual civil/military history. It does not include however, aircraft designed and used primarily for civil aviation.

The sampling of systems was selected because of wide proliferation across numerous countries or because of already extensive use in training scenarios. Additional data sheets addressing other widely proliferated helicopter systems will be sent with further supplements to this guide.


Because of the increasingly large numbers of variants of each aircraft, only the most common variants produced in significant numbers were addressed. If older versions of helicopters have been upgraded in significant quantities to the standards of newer variants, the older versions were not addressed.

The munitions available to each aircraft are mentioned, but not all may be employed at the same time. The weapon systems inherent to the airframe are listed under armament. The most probable weapon loading options are also given, but assigned mission dictates actual weapon configuration. Therefore, any combination of the available munitions may be encountered.

Questions and comments on data listed in this chapter should be addressed to:

CPT Michael Kubala
DSN: 552-7922, Commercial (913) 684-7922
e-mail address: kubalam@leavenworth.army.mil

Russian Attack Helicopter Mi-28/HAVOC

		Most Common Armament: 1x 2A42 30-mm cannon 4x AT-6/SPIRAL or 4x AT-9/ATAKA ATGMs 4x 80-mm rocket pod or 4x 57-mm rocket pod Other Loading Options: Twin 23-mm gun pods 500-kg bombs External fuel tanks 2x AA-16/GIMLET or 2x AA-18/ GROUSE AAM	Combat Load: 300 4 ea 20 ea 16 ea 940 4 2 ea
SYSTEM Alternative Designations: N/A Date of Introduction: N/A Proliferation: Preproduction. No fielding plan due to funding constraints. Only a few prototypes of each model have been constructed. Description: Crew: 2 pilots in tandem cockpits Blades: Main rotor: 5 Tail rotor: 4 (in "X" configuration) Engines: 2x 2,200-shp Klimov TV3-117VMA turboshaft Weight (kg): Max Gross: 11,500 Normal Takeoff: 10,400 Empty: 7,000 Speed (km/h): Max (level): 300 Cruise: 260 Sideward: 100, Rearward: 100 Turn rate: 60°/second Max "G" Force: -.5 to +3.7 g Ceiling (m): Service: 6,000 Hover (out of ground effect): 3,600 Hover (in ground effect): INA Vertical Climb Rate (m/s): INA Fuel: (liters) Internal: 1,900 Internal Aux Tank: N/A External Fuel Tank: INA Range: (km) Max Load: INA Normal Load: 475 With Aux Fuel: 1,100	Dimensions: (m) Length (rotors turning): 21.2 Length (fuselage): 16.8 Width (including wing): 4.9 Height: 4.7 Main Rotor Diameter: 17.2 Tail Rotor Diameter: 3.8 Cargo Compartment Dimensions: Negligible Standard Payload: 3,640 kg on 4 underwing stores points. Survivability/Countermeasures: Main rotors and engines electrically deiced. Infrared signature suppressors can be mounted on engine exhausts. Radar warning receivers, pressurized cockpit, IFF, chaff, decoys and flares. Armored cockpit and self-sealing fuel tanks. Pilot ejection system (see NOTES). ARMAMENT 30-mm Automatic Cannon, 2A42: Range: Effective 3,000 m Elevation: -40° to +13°, Traverse: ±110° Ammo Type: HE, or AP Rate of Fire: 300 or 800 Most Probable Armament: HAVOC A/N: Chin-mounted 30-mm gun, 80-mm rockets, 16x ATGMs. ATGM, AT-6/SHTURM: Guidance: SACLOS RF Range: 5,000-7,000 m (variant dependant) Warhead: Tandem HEAT Penetration: 700-950 mm (variant dependant) ATGM, AT-9/ATAKA: Guidance: SACLOS RF Range: 6,000 m Warhead: Tandem HEAT Penetration: 1,000 mm	80-mm Folding Fin, Unguided Rocket, S-8: Range: 2 to 3 km Warhead: AP or HE 20 rockets per pod, 2 pods carried SENSOR/OPTICS The HAVOC uses optical magnification, a laser designator, HUD, a pair of FLIR sensors, and a targeting radar for target engagement. Night/Weather Capabilities: The Mi-28A is primarily a daylight only aircraft. The Mi-28N has avionics upgrades, and the use of night-vision goggles allows a day/night, all-weather mission capability. VARIANTS Mi-28N: Known as the "night version". This version features an integrated rotor-hub radar for both targeting and navigation, a full autopilot, an inertial navigation system, and an optical, thermal, and low-light level TV helmet targeting system for target engagement. Night vision goggles are employed. The engines are upgraded to 2x 2,500-shp Klimov TV3-117SB3 turboshaft, and the transmission and rotor blades are more efficient. This accounts for the added avionics weight, and increases the armament basic load to 500x 30-mm cannon rounds, 16x AT-9 or AT-16 VIKhR ATGMs, 2x rocket pods, and up to 4x air-to-air missiles. The aircraft's systems allow for the orchestration of group combat actions through datalinks.	

Russian Attack Helicopter Mi-28/HAVOC continued

NOTES

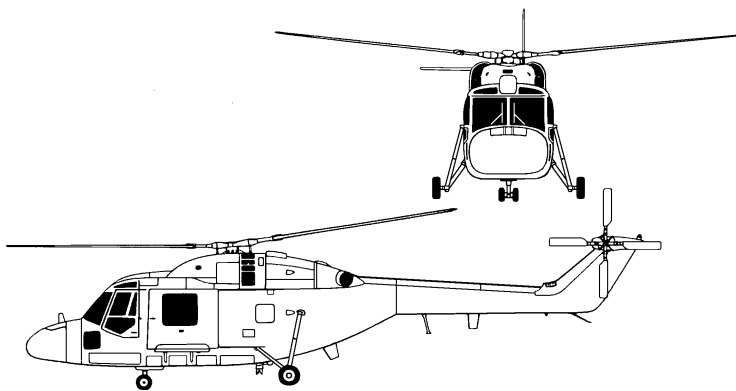
This aircraft is not fielded. Only a handful of prototypes exist, and it has not yet been approved for full-scale production.

Although this aircraft is routinely compared to the U.S. AH-64 Apache, it is much larger and less maneuverable than its U.S. counterpart. The cockpit glass is bulletproof to 12.7-mm rounds, and resistant to fragmentation from 20-mm shells. The armored cockpit frame is made of titanium, steel, and ceramic. It can also withstand hits of 20-mm shells at a minimum. Rotor blade-tip pitot tubes give speed and drift information for targeting at low airspeed. The HAVOC has a high altitude ejection system that jettisons wings and cockpit doors while the crew jumps to safety with parachutes. It has a "technical compartment" which accommodates two persons. This is used to evacuate a crew from a downed aircraft. Available munitions are shown above; not all may be employed at one time. Mission dictates weapon configuration. External stores are mounted on underwing external hardpoints. Each wing has two hardpoints for a total of four stations. A typical mix for targeting armor formations is 16x ATGMs, 300x 30-mm cannon rounds, and 2x 20-round pods of 80-mm rockets. The 30-mm cannon is the same as on the BMP-2. A helmet sighting system turns the cannon in the direction the pilot is looking. However, the cannon is usually fired in the stowed position only.

NOTES

Available munitions are shown above; not all may be employed at one time, mission dictates weapon configuration. External stores are mounted on weapons racks on each side of the fuselage. The Mi-17 has six external hardpoints. Additional missions include; attack, direct air support, electronic warfare, airborne early warning, medevac, search and rescue, and minelaying. Interior seats are removable for cargo carrying. The rear clamshell doors open, an internal winch facilitates loading of heavy freight. Floor has tie down rings throughout. The aircraft carries a rescue hoist capable to 150 kg. The Mi-17 is capable of single-engine flight in the event of loss of power by one engine (depending on aircraft mission weight) because of an engine load sharing system. If one engine fails, the other engine's output is automatically increased to allow continued flight. See also Mi-8.

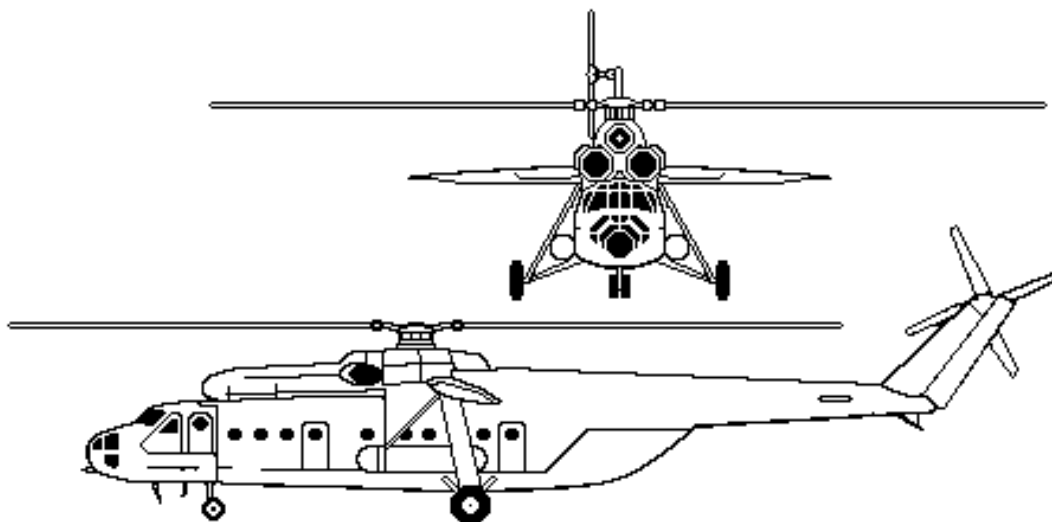
United Kingdom Multi-role Helicopter LYNX

		Weapon & Ammunition Types Other Loading Options 20-mm MG 2x 7.62-mm AA-52 FN MG pods 12.7-mm machinegun pod 20-mm GIAT Minigun pods 2x Antitank missile pods (4 each) 2x AAM pod 2x 68-mm or 2.75-in rocket pods (18 or 19 each)	Combat Load 2 2 2 2 8 2 36 or 38
SYSTEM Alternative Designations: Battlefield Lynx, Super Lynx, Light Battlefield Helicopter, AH-1 Date of Introduction: 1977 Proliferation: At least 11 countries Description: Variants in “()” Crew: 2 (pilots) Blades: Main rotor: 4 Tail rotor: 4 Engines: 2x 900-shp Rolls Royce Gem 42-1 turboshaft, 2x 1,260 LHTEC CTS800-4N turboshaft (Mk 9) Weight (kg): Max Gross: 4,535, 5,126 (Mk 9) Normal Takeoff: 2,658, 3,496 (Mk 9) Empty: 2,578 Speed (km/h): Max (level): 289 Cruise: 259, 285 (Mk 9) Sideward: 130, Rearward: INA Max “G” Force: +2.3 to -0.5 Ceiling (m): Service: INA Hover (out of ground effect): 3,230, 5,126 Hover (in ground effect): 3,660 Vertical Climb Rate (m/s): 7 Fuel (liters): Internal: 985 Aux fuel : 696 Range (km): Normal Load: 630 With Aux Fuel: 1,342 Dimensions (m): Length (rotors turning): 15.2 Length (fuselage): 13.2 Width: 3.8, 3.0 (Mk 9) Height: 3.7 Main Rotor Diameter: 12.8 Tail Rotor Diameter: 2.2, 2.4 (Mk 9)	Cargo Compartment Dimensions (m): Floor Length: 2.1 Width: 1.8 Height: 1.4 Standard Payload (kg): Internal load: 907 External on sling only: 1,360, 2,000 (Mk 9) Transports 9 troops, 6 litters or cargo. Survivability/Countermeasures: Engine exhaust suppressors. An infrared jammer, and flare/chaff dispensers are available. Rotor brake and self-sealing fuel tanks. ARMAMENT The Lynx employed by ground forces can be equipped with two 20-mm cannons mounted externally to permit 7.62-mm machineguns to be fired from the cabin. Two fuselage pylons allow for external stores. Most Probable Armament The armed versions have side-mounted 20-mm machineguns and 8x HOT/Hellfire/TOW ATGMs. An additional load of 8 missiles can be carried in the cabin. Army variants equipped for TOW missiles have a roof-mounted sight (over the left-hand pilot’s seat) with IR and thermal capabilities for firing. Optional equipment allows for target magnification, LLLTV, cameras, and IR searchlight.	AVIONICS/SENSOR/OPTICS Night/Weather Capabilities: The aircraft is NVG compatible, and through its instruments, avionics, autopilot, and doppler navigation system, is capable of operation in day, night, and instrument meteorological conditions. VARIANTS Developed under a partnership between predominantly Westland of the United Kingdom, and Aerospatiale of France. Listed below are the primary, most proliferated variants used by ground forces. Many others exist in small numbers for ground and naval forces. Lynx AH. Mk 1: The basic army general purpose and utility version. This aircraft has skid-type landing gear. Most have been converted to Mk 7 format. Lynx AH. Mk 7: Also known as AH 1 . Upgraded British army version, some with improved main rotor blades. Reverse-direction tail rotor to reduce noise signatures and improve performance. This aircraft has skid-type landing gear. Lynx AH. Mk 9: Also known as Super Lynx or Light Battlefield Helicopter . Implemented tricycle-type landing gear, improved rotor blades, and upgraded engines to increase performance. Mostly used in tactical transport role, with no ATGM launch capability. Battlefield Lynx: Export version of Lynx AH. Mk 9 that can be armed with ATGMs.	

NOTES

This aircraft was designed to be both a transport and an attack aircraft. Additional missions include: VIP transport, search and rescue, mine-laying, and anti-submarine warfare. Squadrons are aligned along aircraft models. Available munitions are shown above; not all may be employed at one time. Mission dictates weapon configuration. External stores are mounted on two points. Each fuselage side has one pylon allowing for a single gun pod or missile rack. The Lynx is capable of single-engine flight in the event of loss of power by one engine (depending on aircraft mission weight) because of an engine load sharing system. If an engine fails, the other’s output is increased to allow continued flight.

Russian Transport Helicopter Mi-6/HOOK

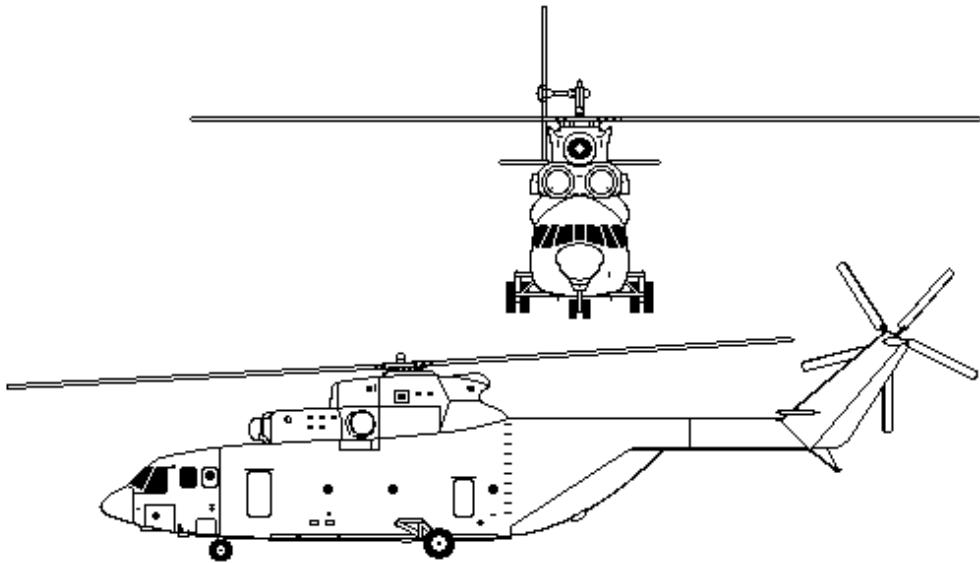


<p>SYSTEM</p> <p>Alternative Designations: INA</p> <p>Date of Introduction: 1961</p> <p>Proliferation: At least 15 countries</p> <p>Description:</p> <p>Crew: 5 (2x pilots, 1x navigator, 1x flight engineer, 1x radio operator)</p> <p>Blades:</p> <ul style="list-style-type: none"> Main rotor: 5 Tail rotor: 4 <p>Engines: 2x 5,500-shp Soloviev D-25V (TV-2BM) turboshaft</p> <p>Weight (kg):</p> <ul style="list-style-type: none"> Max Gross: 42,500-46,800 Normal Takeoff: 40,500 Empty: 27,240 <p>Speed (km/h):</p> <ul style="list-style-type: none"> Max (level): 300 Cruise: 250 <p>Ceiling (m):</p> <ul style="list-style-type: none"> Service: 4,500 <p>Fuel (liters):</p> <ul style="list-style-type: none"> Internal: 6,315 Internal Aux Tank: INA External Fuel Tank: 3,490 	<p>Range (km):</p> <ul style="list-style-type: none"> Max Load: 620 With Aux Fuel: 1,000 km <p>Dimensions (m):</p> <ul style="list-style-type: none"> Length (rotors turning): 41.7 Length (fuselage): 33.2 Width (including wing): 15.3 Height: 9.9 Main Rotor Diameter: 35.0 Tail Rotor Diameter: 6.3 <p>Cargo Compartment Dimensions (m):</p> <ul style="list-style-type: none"> Floor Length: 12 Width: 2.65 Height: Variable from 2.0 to 2.5 <p>Standard Payload:</p> <ul style="list-style-type: none"> Internal: 12,000 kg with rolling takeoff External: 8,000 kg at hover Transports over 65 troops, or 41 litters, or 1x BRDM-2 scout car, or 1x BMD, or 1x GAZ truck, or 1x 7,500 liter POL truck or 12,000 liters in soft bladders. <p>Survivability/Countermeasures:</p> <ul style="list-style-type: none"> Main rotor blades electrically deiced. Tail rotor blades have internal anti-icing fluid. <p>ARMAMENT</p> <p>Some aircraft used for tactical missions have a 12.7 mm machinegun in the nose.</p>	<p>AVIONICS/SENSOR/OPTICS</p> <p>Night/Weather Capabilities:</p> <p>The avionics and navigational package, and a fully functioning autopilot allow for day/night all-weather operation.</p> <p>VARIANTS</p> <p>Mi-6A/-6T/HOOK A: Basic civil and military transport version.</p> <p>Mi-6VKP/HOOK B: Airborne command post variant.</p> <p>Mi-6VUS/HOOK C: Developed airborne command post. Also known as Mi-22.</p> <p>Mi-6AYaSh/HOOK D: Airborne command post with possible side-looking airborne radar fairing.</p> <p>Mi-6S: Medevac variant.</p> <p>Mi-6TZ: Tanker variant.</p>
--	--	---

NOTES

Removable stub wings, when installed, are fixed at a 15° incidence relative to the longitudinal axis. They provide 20% of the total lift in forward flight. Aircraft production ended in 1981. Aircraft has hydraulically actuated rear clamshell doors and ramp, provisions for internal cargo tie-down rings, an 800 kg capacity internal winch system in cargo compartment, floor capacity is 2,000 kg/m², and a central hatch in the cabin floor for sling loads.

Russian Transport Helicopter Mi-26/HALO

		
<p>SYSTEM</p> <p>Alternative Designations: INA Date of Introduction: 1983 Proliferation: At least 5 countries</p> <p>Description: Crew: 5 (2x pilots, 1x navigator, 1x flight engineer, 1x loadmaster) Blades: Main rotor: 8 Tail rotor: 5 Engines: 2x 11,400-shp Lotarev D-136 turboshaft Weight (kg): Maximum Gross: 56,000 Normal Takeoff: 49,500 Empty: 28,240 Speed (km/h): Maximum (level): 295 Cruise: 255 Ceiling (m): Service: 4,500 Hover (out of ground effect): 1,800 Hover (in ground effect): 4,500 Vertical Climb Rate: INA</p>	<p>Fuel (liters): Internal: 11,900 Range (km): Maximum Load: 800 Normal Load: INA With Aux Fuel: 1200 km Dimensions (m): Length (rotors turning): 40 Length (fuselage): 33.5 Width: 8.2 Height: 8.1 Main Rotor Diameter: 32 Tail Rotor Diameter: 7.6 Cargo Compartment Dimensions (m): Floor Length: 12 Width: 3.3 Height: variable from 2.9 to 3.2 Standard Payload: Internal or external load: 20,000 kg Transports over 80 troops, 60 litters, or 2x BRDM-2 scout cars, or 2x BMDs, or 1x BMP or, 1x BTR-60/70/80 or, 1x MT-LB.</p> <p>Survivability/Countermeasures: Main and tail rotor blades electrically deiced. Infrared signature suppressors on engines. Infrared jammers and decoys; flares. Self-sealing fuel tanks.</p>	<p>ARMAMENT</p> <p>None</p> <p>AVIONICS/SENSOR/OPTICS</p> <p>Night/Weather Capabilities: The avionics and navigational package, a Doppler weather radar, and a fully functioning autopilot allow for day/night all-weather operation.</p> <p>VARIANTS</p> <p>Mi-26MS: Medical evacuation version.</p> <p>Mi-26T: Freight transport.</p> <p>Mi-26TZ: Fuel tanker with an additional 14,040 liters of fuel in 4x internal tanks and 1,040 liters of lubricants, pumped through 4x 60-meter long refueling nozzles for refueling aircraft, and 10x 20-meter long hoses for refueling ground vehicles. Fuel transfer rate is 300 liters/minute for aviation fuel, and 75-150 liters/minute for diesel fuel. The refueling system can easily be removed to allow the aircraft to perform transport missions.</p>

NOTES

The HALO A has no armament. The load and lift capabilities of the aircraft are comparable to the U.S. C-130 Hercules transport aircraft. The length of the landing gear struts can be hydraulically adjusted to facilitate loading through the rear doors. The tailskid is retractable to allow unrestricted approach to the rear clamshell doors and loading ramp. The cargo compartment has two electric winches (each with 2,500 kg capacity) on overhead rails can move loads along the length of the cabin. The cabin floor has rollers and tie-down rings throughout. The HALO has a closed-circuit television system to observe positioning over a sling load, and load operations. The Mi-26 is capable of single-engine flight in the event of loss of power by one engine (depending on aircraft mission weight) because of an engine load sharing system. If one engine fails, the other engine's output is automatically increased to allow continued flight.